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(54) Abstract Title: Spectacles with integral hands free kit for mobile phone

(57) A pair of spectacles incorporating and formed integrally with at least an earpiece 20, a microphone 22, a power source and a radio communication circuit.

In one embodiment, the spectacles function as a hands free kit for a remote unit such as a mobile phone or computer. A further embodiment incorporates a entire cellular phone into the frame of the glasses or sunglasses (see fig. 2). The lenses of the spectacles may be photochromic. Also disclosed is a carrying case or hard case (see fig. 3), which may serve as a means for recharging the battery of the spectacles or as the remote unit. The case may have means for displaying information or may be used as a navigation device.

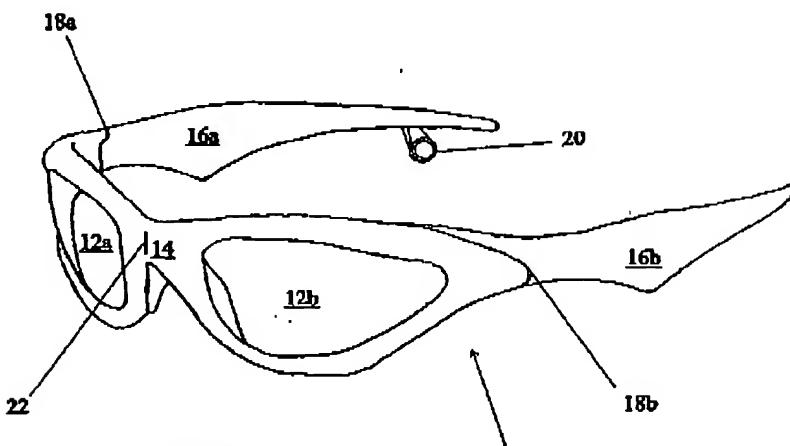


Figure 1

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

This print takes account of replacement documents submitted after the date of filing to enable the application to comply with the formal requirements of the Patents Rules 1995

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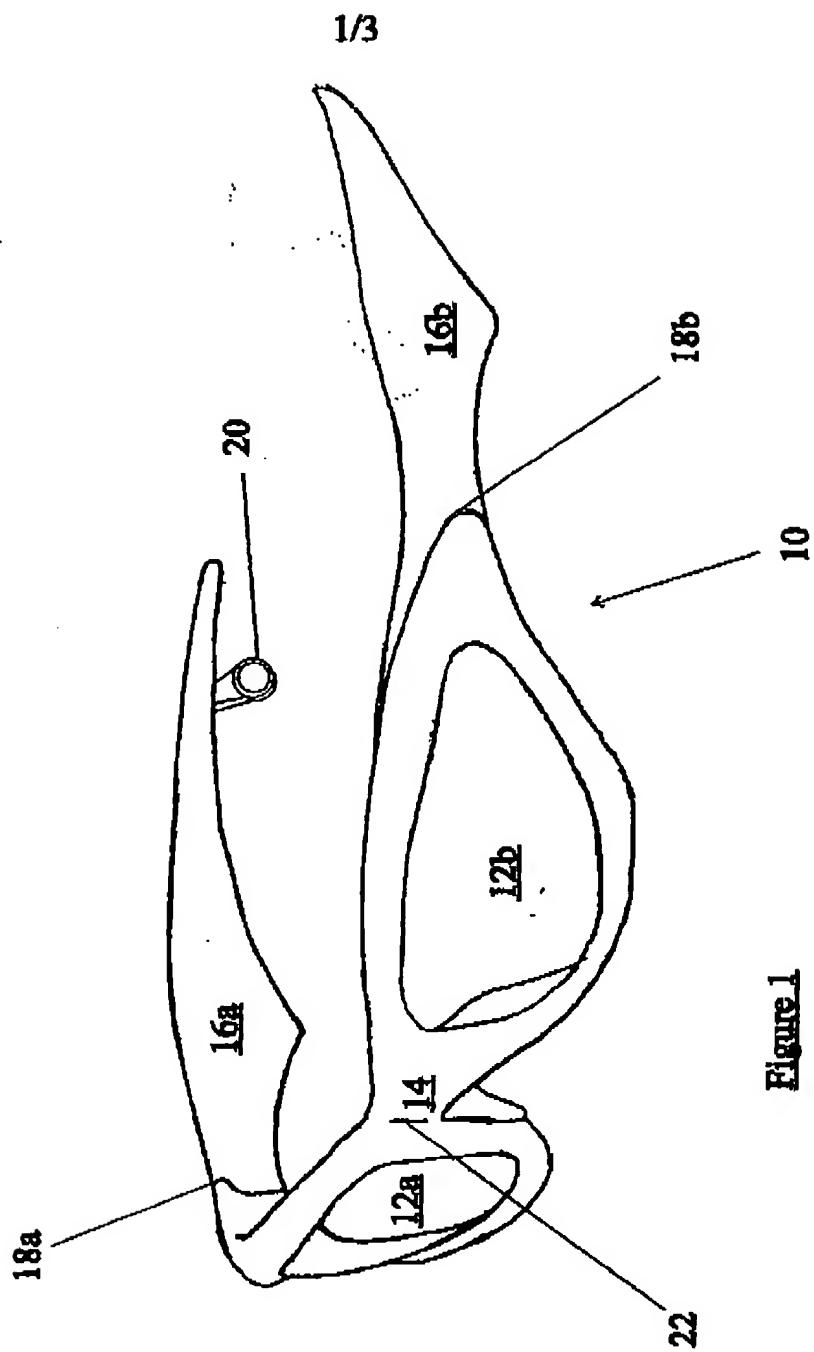


Figure 1

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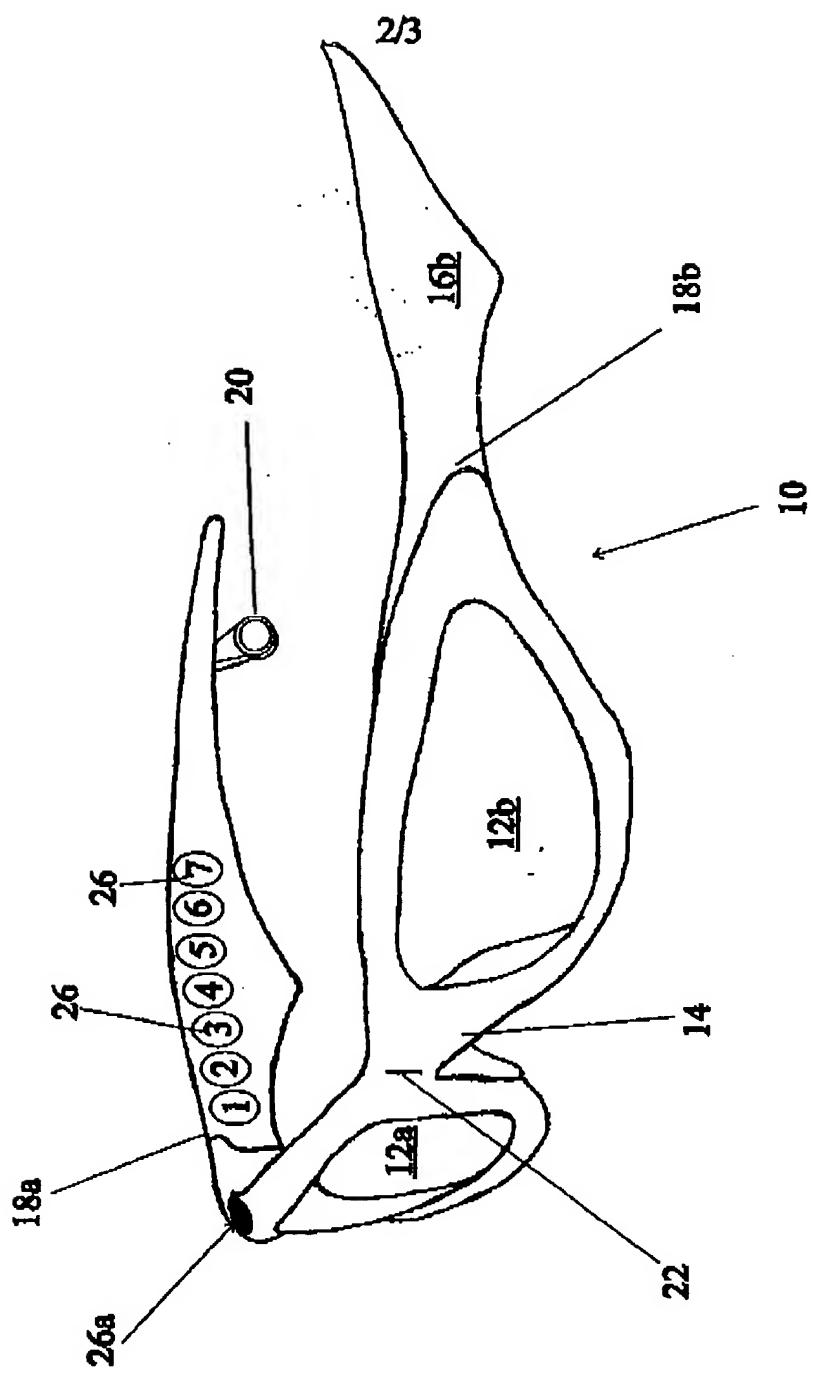
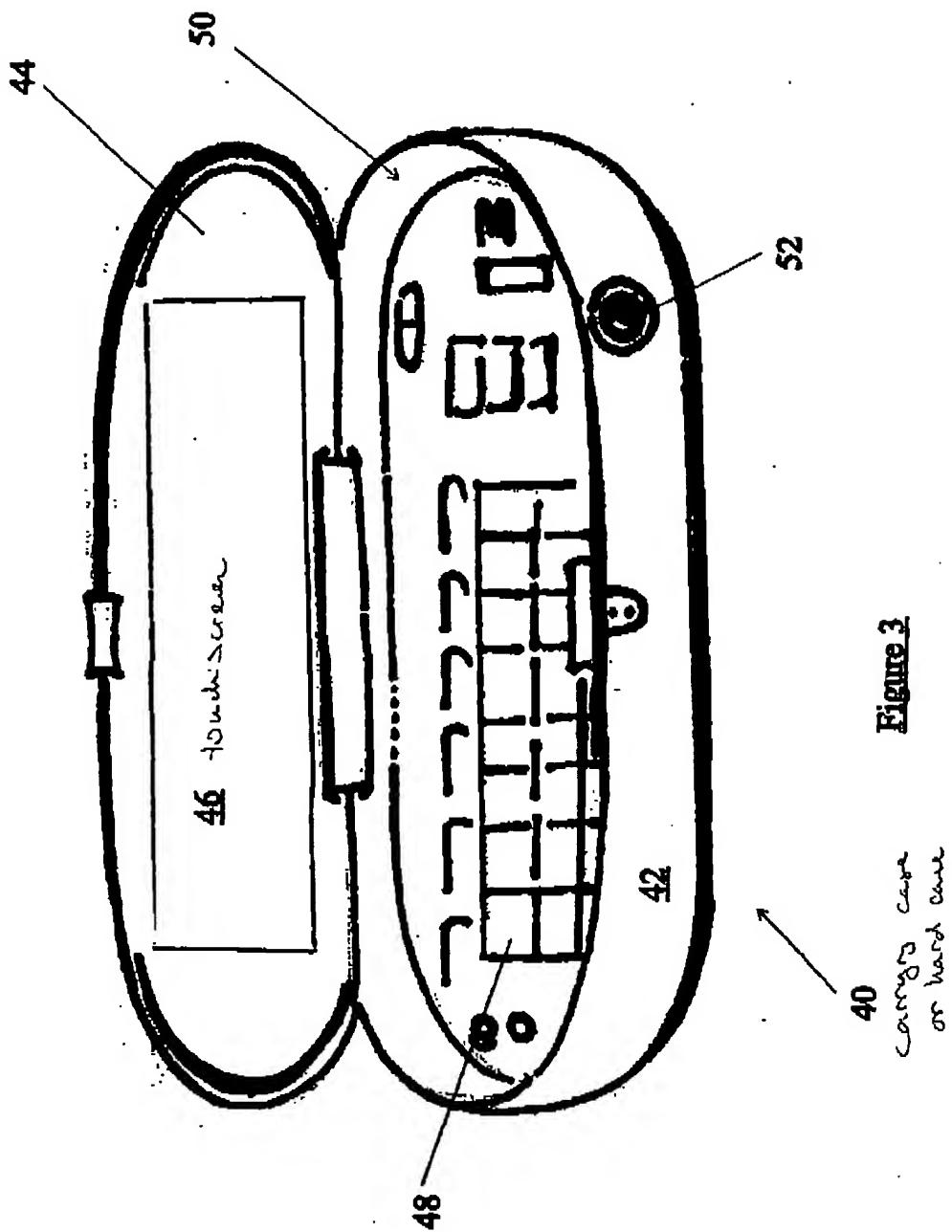


Figure 2

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Hands Free Kit

5 This invention relates to a hands free kit for use with a mobile phone and to a telephone incorporating such a hands free kit. The term mobile phone is used herein to refer either to a cellular phone or to a wireless telephone extension that communicates with a base unit connected to a land line.

10 The popularity of cellular phones has led to several concerns regarding the safety of their use, these stem from concern regarding the possible danger of exposure to electromagnetic radiation causing cancer with prolonged use of a cellular phone in close proximity to the ear.

15 Though the evidence regarding the health hazard caused by cellular telephones is inconclusive, there is a risk of road accidents if such phones are used while driving. A driver using one hand to hold a mobile phone to his head, 20 compromises his ability to drive safely and legislation is being passed in many countries to make the use of hand held phones illegal while driving.

25 For these and other reasons, it has already been proposed to provide cellular phones with hands free kits. These consist of an earpiece which is often placed within the ear and a mouthpiece that hangs down on a wire to lie on the chest of the user. The wire may then connect into the phone unit. This has the advantage that no hands need be 30 used to support the phone, leaving the driver unencumbered to control the vehicle. It also results in the phone being located away from the user's head. Since electromagnetic radiation intensity follows an inverse square law, remotely 35 locating the phone will reduce the exposure of the user to electromagnetic radiation emitted by the phone.

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This still leaves the problem that functions need to be controlled via the phone's keypad. However, voice recognition allows the answering and making of calls to be performed without viewing a screen or touching a keypad, 5 which makes operation easier and safer when driving.

The advent of recent improved technology, namely Bluetooth®, has enabled a wireless connection between the phone and the hands free kit. The resulting hands free 10 apparatus takes the form of an earpiece with workings which rest on the ear, having a boom which extends towards the mouth, for supporting a microphone.

While functionally adequate, such wireless hands free 15 kits are somewhat bulky, and unattractive as well as being uncomfortable when used over long periods, due to their weight being supported entirely on one ear.

With a view to mitigating the foregoing problem, the 20 present invention provides in its broadest aspect A pair of spectacles incorporating and formed integrally with at least an earpiece, a microphone, a power source and a radio communication circuit. The term spectacles is used herein to include sunglasses as well as prescription glasses.

25

Incorporating a microphone and earpiece in spectacles effectively creates a dual purpose fashion accessory that is both attractive and functional. Since spectacles, and in particular sunglasses are supported by the ears, it enables 30 easy and comfortable positioning of a suitably placed speaker or earpiece.

It is preferred for the wireless link to be a radio link (i.e. a radio transmitter/receiver) mounted within the 35 frame of the spectacles. Such a radio link should preferably have a weak transmitter (to reduce any radiation hazard) for communicating with a remote unit or handset located nearby

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but it is conceivable that the spectacles may act as a self contained mobile or cellular telephone.

The remote unit with which the microphone and earpiece 5 communicate need not necessarily be a mobile telephone, though that is believed to be the primary application for the present invention. It may alternatively be a PDA, a portable or desktop computer, all of which are currently available with Bluetooth® technology.

10

It is preferred for the lenses of the spectacles to be photo-chromic. Because photo-chromic lenses darken automatically when exposed to bright light, they enable the spectacles to be used under all lighting conditions.

15

Mobile phones often have screens for displaying relevant information. In an embodiment of the invention, an LCD display screen is incorporated into a lens of the spectacles.

20

The internal power source is preferably a rechargeable battery. A jack plug may be provided to enable the battery to be charged by a wired connection but, alternatively, power can be coupled into the spectacles to recharge the 25 internal battery by means of an inductive loop.

The remote unit or handset with which the circuitry mounted in the spectacles communicates may suitably be designed as a case for the spectacles. Preferably, such a 30 case may additionally include means for charging any internal battery of the spectacles.

It is possible to incorporate control buttons into the frame of the spectacles and these are preferably mounted on 35 the inner side of the frame arms.

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The present invention will now be described further by way of example with reference to the accompanying drawings in which:

Figure 1 is a perspective view of a pair of sunglasses embodying the a preferred embodiment of the invention,

Figure 2 is a similar perspective view of an alternative embodiment, and

Figure 3 shows a case for the spectacles of Figure 1.

10 The spectacles shown in Figure 1, in this example sunglasses 10, are outwardly conventional in appearance. They comprise two lenses, 12a and 12b intended to be positioned in front of the eyes of a user. The lenses are supported by a frame 14 shaped in the usual manner to 15 support the weight of the sunglasses on the bridge of the nose. The frame, as is conventional, may be made of metal or a plastics material and its style may vary widely depending on the preference of the user, the spectacles illustrated being aimed at the sports market.

20 The frame 14 has two arms 16a and 16b folding about hinges 18a and 18b respectively. The hinges allow the sunglasses to be folded for easier storage when not in use. The arms 16a and 16b extend rearwards from the frame and 25 rest above the ears of a user, to secure the lenses 12a and 12b in relation to the eyes.

30 A microphone 22 is incorporated into the bridge piece of the frame 14. Furthermore, an earpiece 20 intended for insertion into the ear of the user depends from either or both arms 16a and or 16/b depending on the user's preference.

35 In order to function as a hands free kit, sunglasses 10 require a signal and power. For this purpose, the frame 10 acts also to house a battery and a radio link (not visible in the drawing).

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✓ The radio link communicates with a mobile phone or a remote unit such as a PDA or a computer. This may be achieved via any of the several existing wireless protocols 5 such as Bluetooth® or 802.11b.

Answering and making of calls with such arrangement can be achieved by means of voice activation which is commonly known in the art with reference to existing hands free kits.

10

A further embodiment of the present invention, shown in Figure 2, incorporates a entire cellular phone into the frame 14 of the sunglasses 10. Modern mobile phones have removed unsightly aerials and produced smaller technology 15 which enables the microprocessor of the unit to be hidden within the frame, retaining the design of the sunglasses. Similarly to the simpler hands free sunglasses described by reference to Figure 1, known voice recognition technology may be employed in order to control the basic features of 20 the phone.

Alternatively, in order to operate the phone, the embodiment of Figure 2 provides buttons 26, arranged on the inside of arms 16a and 16b. for further convenience, a 25 primary function key 26a may be provided on the outside rim of the frames of the sunglasses. Such a button can be easily reached whilst the sunglasses are being used and may be programmed to provide the most important features of the phone simply by pressing one button.

30

Conventional mobile phones have an LCD display screen for indicating dialled numbers and other information such as battery and signal strength, such information may be displayed on a similar panel (not shown) located on the 35 frame 14, or alternatively by using a lens 12a or 12b as an LCD display screen.

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If a rechargeable battery is mounted in the frame of the spectacles, it can be recharged either by means of a wire connection. Conveniently the station used to recharge the battery may be designed as a carrying case for the 5 spectacles. When using a case such as that shown in figure 3, an inductive loop 50 may be employed to charge the phone without the need for cumbersome connecting wires. The case 40 would merely derive its own power by a jack plug connection 52 with a mains power source.

10 ✓ The carrying case or hard case 40, as shown in figure 3, is conventional in design having a container section 42 and a lid 44. In addition to serving as a means for recharging the internal battery of the spectacles, it may 15 act in the case of the embodiment of Figure 1 as the remote unit. Hence the carrying case may comprise a cellular phone. For such features and others described in more detail below, the case 40 would require its own power supply.

20 Where the sunglasses 10 incorporate a cellular phone, the hard case 40 is intended to act as more than simply a charger. Modern cellular phones have many functions such as settings for ringing tones and volumes, calendars, diaries, calculators, and web access via WAP and other protocols. 25 With such control over functionality, simple voice control is not sufficient to enable access to all the features.

30 The hard case 40 may provide access to these functions by interacting with the sunglasses 10, either by wire or more preferably, wireless communication. The case doubles as the carrier of many of the functions of the phone and therefore is provided with means for data entry and retrieval. Such means may include a keyboard 48 and a display screen (or touch screen) 46, arranged conveniently 35 around the inside of the container section 42 and lid 46.

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The hard case 40 can provide features not normally associated with a cellular phone. These include a GPS antenna and receiver, which combined with a database and software, can allow the user to find his way whilst driving, or alternatively as a pedestrian trying to navigate on foot around an unfamiliar city. This can be achieved by looking directly at the display in the case, or by viewing and listening to whatever instructions are transmitted to the sunglasses 10.

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Further features may of course be employed such as internet access via the case 40 as well as the features of any PDA computer, with the added benefit that any or all the information can be conveniently uploaded, or displayed via wireless communication with the sunglasses 10.

15

With such hardware already in place, the hard case is capable of providing many more features, such as acting as a games console, or with provision of an aerial, and a suitable tuner, a radio or television. Equally with sufficient memory, either internal or in the form of memory sticks, the hard case may be easily configured to function as a portable MP3 player, or any other format of music or video. Again, use of the spectacles conveniently enables these features to be employed silently through the ear piece, therein avoiding offending surrounding people, yet conveniently without the use of wires.

Similarly, the case may also be capable of playing 30 footage taken from by camcorder or acting as a portable display screen to view still pictures taken from a digital camera.

With the potential for this number of features, the 35 case is a probably target for theft. With this in mind it would also be prudent to include security features. These

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could consist of the use of personal identification numbers,
or potentially finger print or retinal scanners.

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Claims

1. A pair of spectacles incorporating and formed integrally with at least an earpiece, a microphone, a power source and a radio communication circuit.

2. A pair of spectacles as claimed in claim 1, wherein the radio communication circuit serves to establish a wireless connection between the earpiece and microphone and a nearby remote unit.

3. A pair of spectacles as claimed in claim 1 or 2, wherein the radio communication circuit serves to enable the spectacles to perform as a self-contained mobile or cellular telephone.

4. A pair of spectacles as claimed in any preceding claim, wherein the lenses of the spectacles are photochromic.

5. A pair of spectacles as claimed in any preceding claim, wherein a the power source is a rechargeable battery.

6. A pair of spectacles as claimed in any preceding claim, wherein the power source is provided by means of a solar panel.

7. A pair of spectacles as claimed in any preceding claim, having controls buttons for operating the remote communication circuitry, arranged on the inside edge of the arms for supporting the spectacles.

8. A pair of spectacles as claimed in any preceding claim, having a button capable of performing multiple functions.

9. A pair of spectacles as claimed in any preceding claim wherein the earpiece depends from an arm of the spectacles.

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10. A pair of spectacles as claimed in any claim, further comprising a display screen, connected to the remote communication circuitry.

5 11. A pair of spectacles as claimed in claim 10, wherein the display screen is incorporated into a lens of the spectacles in the form of an LCD.

10 12. A pair of spectacles as claimed in any preceding claim having a jack plug socket for receiving a charging jack for charging the batteries in the spectacles.

15 13. A case for receiving a pair of spectacles as claimed in any claim depending from claim 5, having means for recharging the spectacles.

14. A case as claimed in claim 13, wherein charging is effected by means of an inductive loop.

20 15. A case as claimed in claim 13 or 14, further having means for communicating with the spectacles in order to upload or download information.

25 16. A case as claimed in claim 15, wherein the means for communicating is a wireless link.

17. A case as claimed in claims 13 to 16, further having means for displaying and means for inputting information.

30 18. A case as claimed in claims 13 to 17, further having a GPS aerial and receiver for enabling the case to be used as a navigation device.

35 19. A pair of spectacles constructed, arranged and adapted to operate substantially as herein described with reference to and as illustrated in the accompanying drawings.

Amended claims have been filed as follows**Claims**

1. A case for receiving a pair of spectacles of the type having means for recharging the spectacles of the type formed integrally with at least an earpiece, a microphone, a rechargeable power source and a radio communication circuit characterised by the case having means for recharging the power source of the spectacles.
- 10 2. A case as claimed in claim 1, where the means for recharging is a jack plug for insertion into a socket provided on the spectacles.
- 15 3. A case as claimed in claim 1 or 2, wherein charging is effected by means of an inductive loop.
- 20 4. A case as claimed in any preceding claim, further having means for communicating with the spectacles in order to upload or download information.
5. A case as claimed in claim 4, wherein the means for communicating is a wireless link.
- 25 6. A case as claimed in any preceding claim, further having means for displaying and means for inputting information.
- 30 7. A case as claimed in any preceding claim, further having a GPS aerial and receiver for enabling the case to be used as a navigation device.
- 35 8. A case as claimed in any preceding claim, in combination with a pair of spectacle formed integrally with at least an earpiece, a microphone, a rechargeable power source and a radio communication circuit.

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9. A combination as claimed in claim 8, wherein the radio communication circuit serves to establish a wireless connection between the earpiece and microphone and a nearby remote unit.

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10. A combination as claimed in claim 8 or 9, wherein the radio communication circuit serves to enable the spectacles to perform as a self-contained mobile or cellular telephone.

10 11. A combination as claimed in any of claims 8 to 10, wherein the lenses of the spectacles are photochromic.

12. A combination as claimed in any of claims 8 to 11, wherein the rechargeable power source is further recharged by 15 means of a solar panel.

13. A combination as claimed in any of claims 8 to 12, wherein the spectacles are provided with controls buttons for operating the remote communication circuitry, arranged on the 20 inside edge of the arms for supporting the spectacles.

14. A combination as claimed in any of claims 8 to 13, wherein the spectacles are provided with a button capable of performing multiple functions.

25

15. A combination as claimed in any of claims 8 to 14, wherein the earpiece depends from an arm of the spectacles.

16. A combination as claimed in any of claims 8 to 15, 30 wherein the spectacles further comprise a display screen, connected to the remote communication circuitry.

17. A combination as claimed in claim 16, wherein the display screen is incorporated into a lens of the spectacles in 35 the form of an LCD.

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18. A case for receiving a pair of spectacles constructed, arranged and adapted to operate substantially as herein described with reference to and as illustrated in figure 3 of the accompanying drawings.

5

19. In combination, a case and a pair of spectacles, constructed, arranged and adapted to operate substantially as herein described with reference to and as illustrated in the accompanying drawings.

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